THE COMMON ORIGIN OF THE SEEDY AND TICKY DEFECTS OF SHEEPSKIN

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ABSTRACT

Despite their unrelated names, both the seedy and the ticky defects of domestic sheepskins result from damage caused by the sharp seeds and awns of certain western forage grasses. The difference between them is a matter of degree and the term "ticky" is a misnomer. Actually the small scars found on ticky skins are caused by puncture wounds from the needlelike seeds which, when they become embedded in the skin, also produce the "seedy" defect. Therefore both conditions tend to occur simultaneously, and often with such severity as to damage seriously several types of leather.

Supporting evidence to re-emphasize this common origin was obtained from a representative lot of 36 commercial woolskins originating from six different western sources. Almost half of the pickled skins displayed both defects simultaneously at comparable levels of severity, while in a few cases they were only slightly ticky. The species of recovered seed materials were identified as *Stipa comata* and *S. spartea*.

INTRODUCTION

It has long been recognized that a variety of effects during the life of a sheep can induce skin damage which ultimately impairs the quality of resultant leather (1, 2). In the course of a study to determine the nature and seasonal incidence of the defect known as cockle (3), two other types of damage were frequently observed in salted skins obtained from a local woolpuller.

One type of damage, seen in pickled skins examined by transmitted light (Figure 1a), consisted of a number of embedded or partially embedded sharp seeds, awns, and other plant fragments. Such skins are designated as "seedy" in the trade. They are known to be objectionable for suede and gas-meter leathers in particular, but it may not be realized how frequently the condition occurs or how severe it can be. Lamb (4) has described this defect in South African skins: there it is attributed to the awns of grasses variously known as "Steek-gras" or "Spear Grass," *Heteropogon contortus* (L.) P. Beauv. He also described similar damage common to North and South America, the Mediterranean region, and Australia, due to the awns of another grass, *Stipa charruana* Arech.

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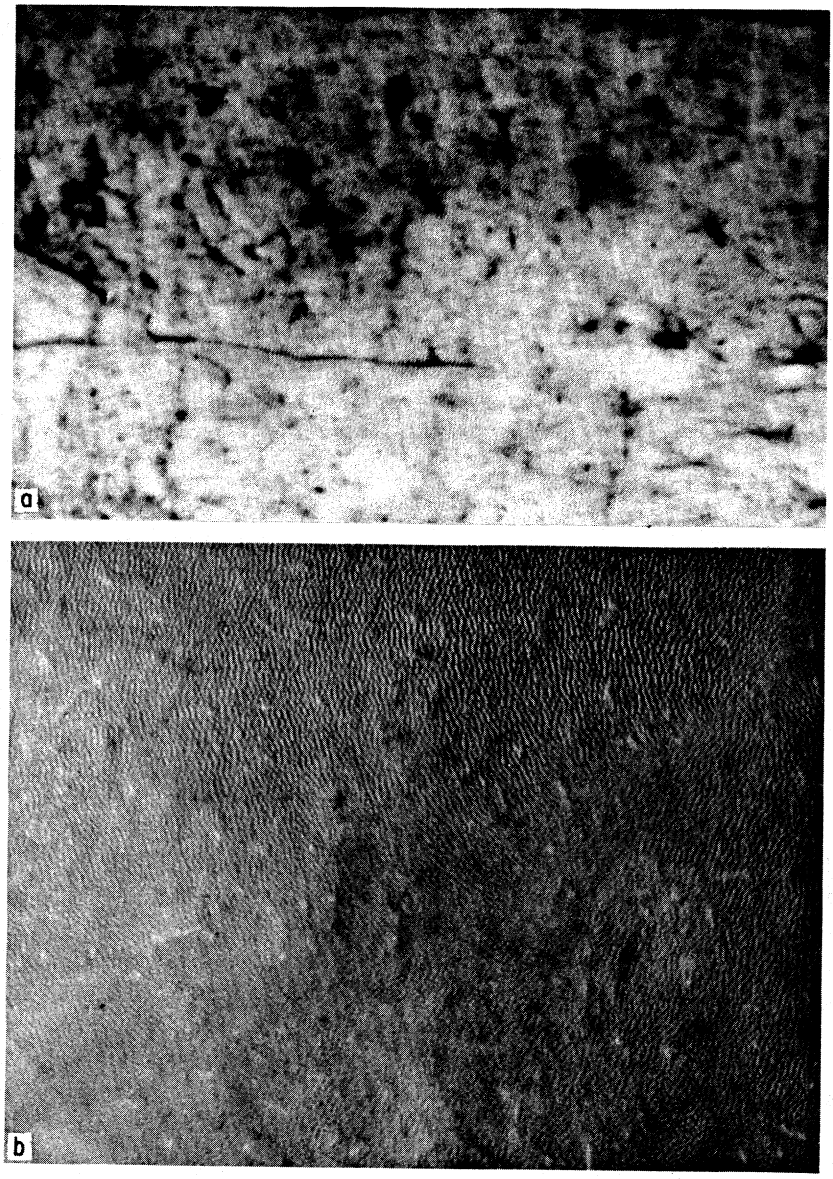

FIGURE 1.—Pickled skin #12 with severe seedy and ticky defects: (a) center portion viewed by transmitted light to show large, dark embedded seeds; (b) closeup view by reflected light showing numerous white scars caused by puncture wounds and scratches by the sharp seeds.

The second type of damage, seen best by reflected light (Figure 1b), consists of a scattering of small white scars on the grain surface, which are usually circular but are often oval or linear. The scars may be concentrated in certain areas or more randomly distributed. Such skins are designated as "ticky" in the trade, and the defect carries into grain leather. Tancous, Roddy, and O'Flaherty (5) pointed out that the implication of tick damage is erroneous, since the scars actually result from puncture wounds by sharply pointed vegetable matter. Their manual also shows pictures of a pickled skin with partially embedded awns, and of grain leather made from a ticky skin.

Thus it appears that both these defects, although by name seemingly unrelated, have in fact a common origin: contact with certain grasses which produce needle-like seeds and awns that either pierce the skin and are then withdrawn to leave scars, or continue to work their way into the skin until they become partially or completely embedded. This report identifies the grass species encountered in domestic skins, gives supporting evidence for the common origin of the two defects, and illustrates the appearance of affected skins and of seedy damage in suede leather.

EXPERIMENTAL

Six lots of salted woolskins, each obtained from a different carload shipment from Midwest packers, were set aside at a local woolpulling plant. Six skins were chosen at random from each of the lots to give a total of 36 skins for laboratory study of defects. Source locations were as follows:

1. West Fargo, North Dakota
2. Chicago, Illinois
3. Denver, Colorado
4. Cedar Rapids, Iowa
5. Lexington, Kentucky
6. Chicago, Illinois

The skins were identified by stamped numerals, the first digit of which corresponded to the geographic source as shown in the above list.

After an overnight soak the skins were painted with lime-sulfide and dewooled on the following day. Then the skins were thoroughly washed and were divided into three equal batches for further treatment under slightly varying conditions. These modifications were used only to observe their effects on cockle. Matched-side tests had shown no significant effects on either seedy or ticky defects. All skins were pickled together in a normal manner and were fleshed by hand to facilitate inspection.

Pickled skins were examined for the seedy defect by transmitted light, as had been done for cockle (3). Severity was expressed by a simple grading system to indicate the relative numbers of embedded seed parts present. Table I shows the

TABLE I

GRADING OF SEEDY SKINS BY SEED COUNT

Skin No.	No. of Embedded Fragments			Grade
	Left	Right	Total	
21, 31, 41, 51				
22, 42, 52, 62	0	0	0	A
32	1	2	3	B
11	9	34	43	B
61	76	72	148	C
12	364	203	567	D

approximate numerical equivalents of the various grades, from representative counts of two skins from each lot.

Severity of the ticky defect was evaluated by reflected light. The scars were so small and numerous (Figure 1b) that actual counts were not attempted. Instead, an arbitrary grade similar to that used for seeds was applied, representing a subjective assessment of relative numbers.

RESULTS

Severity of Defects

As shown in Table II, approximately one half of the skins under study were damaged by the subject defects. Seed parts were present in 17 of the skins, and each of these skins also had the ticky defect at about the same degree of severity. Four skins were free of seeds but were ticky at a low level (Grade B). Both defects were simultaneously present at significant levels (designated "bad" in the table) in one third of the skins. Note that skins from two sources were relatively free of these defects. This is not to imply any consistent superiority of one source over another, since livestock may travel over variable distances between birth and slaughter. The variety of sources was intended mainly to provide a more representative sampling of commercial skins and thus give added significance to the results.

Identity of Seeds

A number of embedded or partially embedded seeds and awns were accumulated as a pooled sample from many of the affected skins. This material was submitted for identification to two different laboratories of the Agricultural Research Service, U. S. Department of Agriculture (see Acknowledgments). Both authorities agreed that the sample consisted of *Stipa sp.*, commonly called "Needlegrass." Some deterioration had taken place which made precise identifi-

TABLE II

SEVERITY OF SEEDY AND TICKY DEFECTS IN 36 DOMESTIC WOOLSKINS

Source	Skin No.	Defect Grade*		Defective Skins**	
		Seedy	Ticky	Seedy	Ticky
1	16	A	B		
	11	B	B		
	13	D	C		
	12, 14, 15	D	D		
				5(4 bad)	6(4 bad)
2	21, 22	A	A		
	26	A	B		
	24	B	B		
	23	C	C		
	25	D	D		
				3(2 bad)	4(2 bad)
3	31, 34	A	A		
	32, 35, 36	B	B		
	33	C	C		
				4(1 bad)	4(1 bad)
4	41, 42, 43, 44	A	A		
	45, 46	A	B		
				0	2
5	51, 52, 53	A	A		
	54, 55, 56				
				0	0
6	62	A	A		
	61, 64, 65, 66	C	C		
	63	D	D		
				5(5 bad)	5(5 bad)
				17(12 bad)	21(12 bad)

*A — free of defects; B — relatively low number; C — moderate number; D — large number (see Table I).

**Total number of defective skins from each source, the term "bad" referring to Grades C and D.

cation difficult, but the material was determined to be a mixture of two similar species: *Stipa comata* and *Stipa spartea*. Of these, the former is considered to be the more common and is especially abundant in the Northern Great Plains. The 1948 Yearbook of Agriculture (6) describes this group of grasses, pointing out that *S. comata* is commonly known as "Needle-and-Thread" because its sharply pointed seed and long, twisted, threadlike awn make it look like a threaded sewing needle.

Effect on Suede Leather

The experimental skins were commercially tanned and finished into light-brown garment suede. Seediness caused uneven coloring in suede in the form of light spots, patches, or streaks, but most commonly as discrete, oval spots much lighter than the background. Figure 2 shows one side of Skin #64 that was rated Grade C seedy. The numerous light spots are evident. Distribution of such spots was quite variable, not tending to form consistent patterns or to display symmetry.

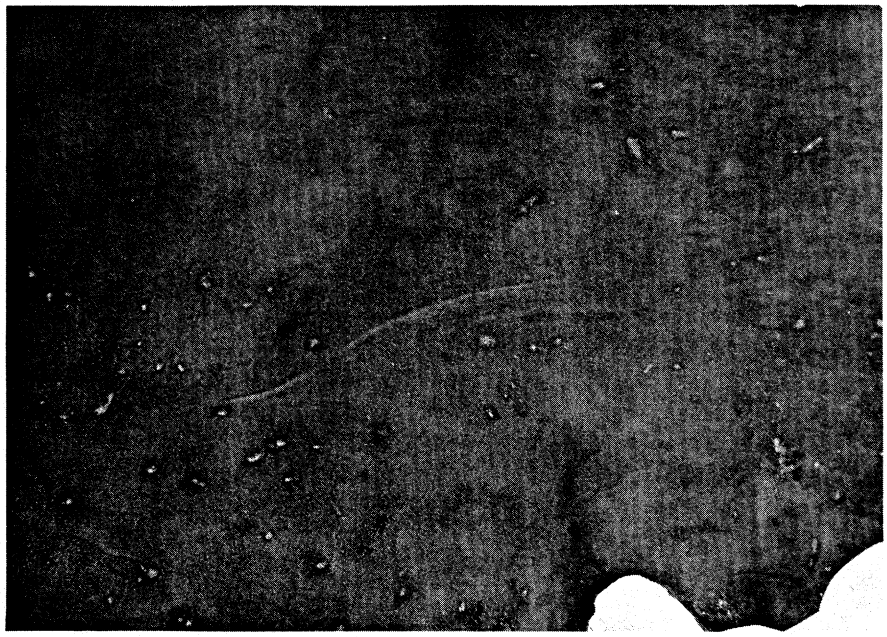

FIGURE 2.—Portion of garment suede made from seedy skin #64 showing light spots around embedded seeds.

DISCUSSION

Simultaneous occurrence of both defects at comparable levels of severity in 17 out of 36 skins is considered to be strong supporting evidence for a common source. The fact that four other skins had the ticky defect alone, at a low level, does not refute this hypothesis. It can be reasoned that brief exposure of sheep to the offending grasses would result in low numbers of puncture wounds, with or without the occurrence of a few embedded seeds. Repeated or prolonged exposure would increase the numbers of both defects, but the chances for seeds to become embedded would always be less than the chances for slight puncture only.

It is not surprising that a variety of vegetable materials accumulate in the wool, owing to the short stature of sheep and to their habitual grazing through tall grasses and underbrush. Needlegrass provides desirable forage in many areas, but livestock tend to graze it sparingly during July, when the seeds mature on stalks one to four feet tall; however, they often graze the standing cured forage during winter (6). The skins described were purchased in April, 1968, probably representing March slaughter. This would allow plenty of time for gradual accumulation and penetration of seeds and for healing of puncture wounds. Lamb (4) has described how the hairy awns can penetrate, like a barbed arrow, by a twisting action imparted by body movements and alternate wetting and drying. Not only is the vegetable contamination undesirable for wool and leather quality, but the skin punctures may become infected and adversely affect the animal's health (4, 8).

It appears that the seedy defect is especially damaging to suede, with little hope of much improvement from processing changes. The ticky damage seems less serious, but it should be emphasized that both conditions tend to occur simultaneously and, in our experience, often combined with cockle. The cause of cockle has now been traced to sheep keds (7), and is not related to seeds. Leather damage commonly ascribed to cockle, however, may be exaggerated by concurrent seediness, or may even be directly due to seeds. Tannery sorters should be alerted to divert seedy skins from suede stock, just as they normally do with cockle skins.

The only obvious ways of preventing seed damage would be to avoid the species entirely, to limit grazing of Needlegrass to the spring months before seed formation, or to attempt chemical or mechanical control of the species. None of these seems practical on the range, but awareness of the specific cause may eventually prove helpful.

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REFERENCES

1. Seymour-Jones, A. "The Sheep and Its Skin." The Leather Trades' Review, London (1913).

2. Blank, I. H., and McLaughlin, G. D. *JALCA*, 24, 544 (1929).

3. Everett, A. L., Willard, H. J., Bitcover, E. H., and Naghski, J. *JALCA,* 64, 150 (1969).

4. Lamb, M. C. *J. Soc. Leather Trades' Chemists,* 14, 207 (1930).

5. Tancous, J. J., Roddy, W. T., and O'Flaherty, F. "Skin, Hide and Leather Defects." Western Hills Publishing Company, Cincinnati, Ohio (1959), p. 68.

6. U. S. Dept. of Agriculture. "Yearbook of Agriculture. Grasses." Government Printing Office, Washington, D. C. (1948), p. 697.

7. Everett, A. L., Roberts, I. H., Willard, H. J., Apodaca, S. A., Bitcover, E. H., and Naghski, J. *JALCA,* 64, 460 (1969).

8. Král, F., and Schwartzman, R. M. "Veterinary and Comparative Dermatology." J. P. Lippincott Co., Philadelphia, Pa. (1964), p. 292.